

IN CASE OF TRANSPORTATION EMERGENCY CONTACT:

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1. IDENTIFICATION

PRODUCT NAME: METHYL ETHYL KETONE

SYNONYM: 2-BUTANONE, MEK

CHEMICAL FORMULA: C₄H₈O

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Appearance: colorless liquid. Flash Point: -7° C.

Danger! May cause respiratory tract irritation. May cause severe eye and skin irritation with possible burns. May cause fetal effects. May cause central nervous system effects. Extremely flammable liquid and vapor. Vapor may cause flash fire.

Target Organs: Central nervous system, eyes, skin, mucous membranes.

Potential Acute Health Effects:

Hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion, of inhalation (lung irritant).

Potential Chronic Health Effects:

Eye: Causes eye irritation. May result in corneal injury.

Skin: May be absorbed through the skin in harmful amounts. Prolonged and/or repeated contact may cause irritation and/or dermatitis.

Ingestion: May cause irritation of the digestive tract. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure. Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. Causes respiratory tract irritation. Irritation may lead to chemical pneumonitis and pulmonary edema. May cause numbness in the extremities.

Chronic: Chronic inhalation may cause effects similar to those of acute inhalation. Prolonged or repeated skin contact may cause defatting and dermatitis. Animal studies have reported that fetal effects/abnormalities may occur when maternal toxicity is seen.

3. COMPOSITION

NAME	CAS #	% BY WEIGHT
Methyl Ethyl Ketone	78-93-3	100

Toxicological Data on Ingredients: Methyl ethyl ketone: ORAL (LD50): Acute: 2737 mg/kg [Rat]. 4050 mg/kg [Mouse]. DERMAL (LD50): Acute: 6480 mg/kg [Rabbit]. VAPOR (LC50): Acute: 23500 mg/m 8 hours [Rat].

4. FIRST AID MEASURES

Eye Contact:

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Get medical attention.

Skin Contact:

In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

5. FIRE FIGHTING MEASURES

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 404°C (759.2°F)

Flash Points: CLOSED CUP: -9°C (15.8°F). OPEN CUP: -5.5556°C (22°F) (Tag).

Flammable Limits: LOWER: 1.8% UPPER: 10%

Products of Combustion: These products are carbon oxides (CO, CO₂).

Fire Hazards in Presence of Various Substances: Highly flammable in presence of open flames and sparks, of heat.

Explosion Hazards in Presence of Various Substances:

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Explosive in presence of oxidizing materials, of acids.

Fire Fighting Media and Instructions:

Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

Special Remarks on Fire Hazards:

Ignition on contact with potassium t-butoxide. Vapor may cause a flash fire

Special Remarks on Explosion Hazards:

Reaction with Hydrogen Peroxide + nitric acid forms heat and shock-sensitive explosive product. Mixture with 2-propanol will produce explosive peroxides during storage.

6. ACCIDENTAL RELEASE MEASURES

Small Spill:

Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill:

Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

7. HANDLING AND STORAGE

Precautions:

Keep locked up.. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, metals, acids, alkalis.

Storage:

Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:

Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:

TWA: 200 STEL: 300 (ppm) from ACGIH (TLV) [United States] [1999] TWA: 150 STEL: 300 (ppm) [Australia] TWA: 590 STEL: 885 (mg/m3) from NIOSH TWA: 200 STEL: 300 (ppm) from NIOSH TWA: 590 STEL: 885 (mg/m3) [Canada] TWA: 200 STEL: 300 (ppm) from OSHA (PEL) [United States] TWA: 590 STEL: 885 (mg/m3) from OSHA (PEL) [United States] Consult local authorities for acceptable exposure limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state and appearance: Liquid.

Odor: Acetone-like Pleasant. Pungent. Sweetish. (Strong.)

Taste: Not available.

Molecular Weight: 72.12g/mole

Color: Clear Colorless.

pH (1% soln/water): Not available.

Boiling Point: 79.6 (175.3°F)

Melting Point: -86°C (-122.8°F)

Critical Temperature: 262.5°C (504.5°F)

Specific Gravity: 0.805(Water = 1)

Vapor Pressure: 10.3 kPa (@ 20°C)

Vapor Density: 2.41 (Air = 1)

Volatility: Not available.

Odor Threshold: 0.25 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 0.3

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether, acetone.

Solubility: Soluble in cold water, diethyl ether, acetone.

10. STABILITY AND REACTIVITY

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ignition sources, mechanical shock, incompatible materials.

Incompatibility with various substances: Reactive with oxidizing agents, metals, acids, alkalis.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:

Incompatible with chloroform, copper, hydrogen peroxide, nitric acid, potassium t-butoxide, 2-propanol, chlorosulfonic acid, strong oxidizers, amines, ammonia, inorganic acids, isocyanates, caustics, pyridines. Vigorous reaction with chloroform +alkali.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

RTECS#:

CAS# 78-93-3: EL6475000

LD50/LC50:

CAS# 78-93-3:

Draize test, rabbit, skin: 500 mg/24H Moderate;

Draize test, rabbit, skin: 402 mg/24H Mild;

Inhalation, mouse: LC50 = 32 gm/m³/4H;

Inhalation, rat: LC50 = 23500 mg/m³/8H;

Oral, mouse: LD50 = 4050 mg/kg;

Oral, rat: LD50 = 2737 mg/kg;

Skin, rabbit: LD50 = 6480 mg/kg;

Chronic Effects on Humans:

MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Classified POSSIBLE for human. May cause damage to the following organs: gastrointestinal tract, upper respiratory tract, skin, eyes, central nervous system (CNS).

Special Remarks on Chronic Effects on Humans: May cause birth defects based on animal data. Embryotoxic and/or fetotoxic in animal.

Carcinogenicity:

CAS# 78-93-3: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: No information available.

Teratogenicity: Embryo or Fetus: fetotoxicity, ihl-rat TCLo=1000 ppm. Specific Developmental Abnormalities: craniofacial and urogenital, ihl-rat TCLo=3000 ppm/7H; musculoskeletal, ihl-rat TCLo=1000 ppm.

Reproductive Effects: No information available.

Neurotoxicity: No information available.

Mutagenicity: Sex chromosome loss/non-disjunction: *S. cerevisiae* 33800 ppm.

Other Studies: See actual entry in RTECS for complete information.

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects: Skin: Causes skin irritation. May be absorbed through the skin. Eyes: Causes eye irritation.

Inhalation: Inhalation of high concentrations may cause central nervous effects characterized by headache, dizziness,

unconsciousness, and coma. Causes respiratory tract irritation and affects the sense organs. May affect the liver and urinary system.

Ingestion: Causes gastrointestinal tract irritation with nausea, vomiting and diarrhea. May affect the liver. Chronic Potential Health

Effects: Chronic inhalation may cause effects similar to those of acute inhalation. Prolonged or repeated skin contact may cause defatting and dermatitis.

12. ECOLOGICAL INFORMATION

Ecotoxicity: Fish: Fathead Minnow: LC50 = 3220 mg/L; 96 Hr; Unspecified Bluegill/Sunfish: LC50 = 1690 mg/L; 96 Hr;

Unspecified rra: *Phytobacterium phosphoreum*: EC50 = 51.9 mg/L; 25 min; Microtox test rra: *Phytobacterium phosphoreum*: EC50 = 3373 mg/L; 30 min; Microtox test Fathead minnow LC50=3220 mg/L/96H Bluegill TLm=5640 to 1690 mg/L/24 to 96H

Environmental: Substance evaporates in water with T1/2= 3D (rivers) to 12D (lakes). Substance is not expected to bioconcentrate in aquatic organisms.

Physical: Substance photodegrades in air with T1/2 = 2.3 days.

Other: None information available.

13. DISPOSAL CONSIDERATIONS

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: CAS# 78-93-3: waste number U159; (Ignitable waste, Toxic waste).

14. TRANSPORT INFORMATION

DOT Classification: CLASS 3: Flammable liquid.

Identification: : methyl Ethyl Ketone UNNA: 1193 PG: II

Special Provisions for Transport: Not available.

PROPER SHIPPING INFORMATION

UN 1193, METHYL ETHYL KETONE, 3, PG II
FLAMMABLE LIQUID

15. REGULATORY INFORMATION

US FEDERAL

TSCA

CAS# 78-93-3 is listed on the TSCA inventory.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)

CAS# 78-93-3: final RQ = 5000 pounds (2270 kg)

Section 302 (TPQ)

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 78-93-3: acute, flammable.

Section 313

This material contains Methyl ethyl ketone (CAS# 78-93-3, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 78-93-3 is listed as a hazardous air pollutant (HAP). This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 78-93-3 can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

California No Significant Risk Level: None of the chemicals in this product are listed. European/International Regulations

European Labeling in Accordance with EC Directives Hazard Symbols:

XI F

Risk Phrases:

R 11 Highly flammable.

R 36 Irritating to eyes.

R 66 Repeated exposure may cause skin dryness or cracking.

R 67 Vapors may cause drowsiness and dizziness.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.

S 9 Keep container in a well-ventilated place.

WGK (Water Danger/Protection)

CAS# 78-93-3: 1

Canada

CAS# 78-93-3 is listed on Canada's DSL List. CAS# 78-93-3 is listed on Canada's DSL List. This product has a WHMIS classification of B2, D2A.

CAS# 78-93-3 is listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 78-93-3: OEL-AUSTRALIA:TWA 150 ppm (445 mg/m³);STEL 300 ppm (890 mg/m³) OEL-AUSTRIA:TWA 200 ppm (590 mg/m³) OEL-BELGIUM:TWA 200 ppm (590 mg/m³);STEL 300 ppm (885 mg/m³) OEL-DENMARK:TWA 100 ppm (290 mg /m³);Skin OEL-FINLAND:TWA 150 ppm (440 mg/m³);STEL 190 ppm;Skin OEL- FRANCE:TWA 200 ppm (600 mg/m³);Skin OEL-GERMANY:TWA 200 ppm (590 mg/m³) OEL-HUNGARY:TWA 200 mg/m³;STEL 600 mg/m³ OEL-INDIA:TWA 200 ppm (590 mg/m³);STEL 300 ppm (885 mg/m³) OEL-JAPAN:TWA 200 ppm (590 mg/m³) OEL-THE NETHERLANDS:TWA 200 ppm (590 mg/m³) OEL-THE PHILIPPINES:TWA 200 ppm (590 mg/m³) OEL-POLAND:TWA 200 mg/m³ OEL-RUSSIA:TWA 200 ppm; STEL 200 mg/m³ OEL-SWEDEN:TWA 50 ppm (150 mg/m³); STEL 100 ppm (300 mg /m³) OEL-SWITZERLAND:TWA 200 ppm (590 mg/m³);STEL 400 ppm OEL-TURKEY :TWA 200 ppm (590 mg/m³) OEL-UNITED KINGDOM:TWA 200 ppm (590 mg/m³);S TEL 300 ppm OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV
OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

16. OTHER INFORMATION

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall CISCO be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if CISCO has been advised of the possibility of such damages.

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